A critical appraisal of "The Immediate Effect of Kinesiology Taping on Muscular Imbalance in the Lateral Flexors of the Neck in Infants: A Randomized Masked Study"

By

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Abstract

This evidence-based study assignment appraises an article written about the immediate effects of kineisotape (KT) on congenital muscular torticollis (CMT) in infants; based on concepts learned in a course required for the Doctor of Physical Therapy program at Angelo State University. Upon selecting an article based off a personal interest question, the experimental study was analyzed for strengths and weaknesses within each section. Ultimately, the researcher provides great detail and support when presenting the study allowing readers to have confidence in the data. Clinically, the researcher applied extra efforts to prevent other factors from hindering the study's reliability. Within the methods, a major strength was found in detailing the process of the experiment allowing for future study replication. Similarly, in the discussion, the author addresses limitations within the study and states the need for further research into the intervention. The author's use of self-sourcing seemed to be the only major flaw found. Aside from this, each portion of the paper had more strengths than weakness when considering the elimination of bias. The study found that KT did have a significant immediate effect on CMT thus supporting my original question. After careful separation and evaluation of each portion, I do believe the article to be dependable for use in the physical therapy profession. This article is aimed toward helping parents understand the use of KT on infants and provides a brief but thorough study as evidence. Appraisal of experimental studies are important in furthering evidence-based practice of physical therapy. Once an intervention has proven to be consistent, the therapist can have more confidence in use during treatments. However, if a therapist cannot correctly appraise an article, he or she may trust an unreliable source. This appraisal provides a guidance to readers in investigating the study's positives and negatives. Thus, allowing the reader to form his or her own opinion on the experiment's authenticity.

Key words- Appraisal; Kinesiology Tape; Imbalance; Infants; Torticollis

Introduction

As a first-year student in the Angelo State University Physical Therapy Program we are required to enroll in a course titled, "Evidence Based Practice in Physical Therapy". In the course students are taught to critically appraise an article to determine its credibility. Given the assignment I began by asking the question; "Is kinesiology tape beneficial in improving the asymmetrical positioning of the head in infants with torticollis?". After, I used unbiased databases to search for potential articles to answer the question asked. Once chosen, I initiated the process of evaluating the author's work. In the course, and assignment, we as students are learning how to conclude the application of a study to our overall profession. Experiments done in physical therapy are immensely important in evolving outcome measures however, it is important to know which studies are trustworthy. Once a study is established as unbiased, its clinical significance has more value. Therefore, this appraisal will facilitate the reader in understanding the strengths and weaknesses of the article.

Methods

When conducting my literature search I used two databases I felt would increase my chances of finding reliable data. For this reason, I primarily used NCBI- Pubmed to search for articles. Once found, I utilized the ASU library U-search to access the full article in PDF format. During my search the keywords used were: pediatrics, kinesiotape, torticollis, wry neck, congenital muscular torticollis and infants. While searching, I only placed a clinical trial limitation on my search due to the specificity of my initial question. This limitation was used

eliminate the risk of using a review or non-experimental article. Along with this, inclusions included “KTape and infants”, while the exclusion was “KTape use for other neck problems”. My inclusion needed to include “infants” because some studies conducted also used healthy infants as the control. I needed to exclude KTape use for other neck issues due to my question asking specifically about torticollis. As mentioned before I was aware my question would not accumulate many “hits”. My initial search included 2 articles; however, after experimenting with multiple key words, I found 4 articles answering my question. I immediately began to read over each article to choose the final literature I would use.

The article I decided on came from a journal titled, “PM&R”, formally known as the American Academy of Physical Medicine & Rehabilitation. The author, Anna Öhamn, PT, PhD published this original research in 2015. Specifically stated, the study took place in Sweden via the Department of Physiotherapy at Queen Silva Children’s Hospital. I chose this article because upon reading, it became clear how much time and effort was placed on this study. When assessing the credibility of the study, I noticed major factors proving the researcher wanted to diminish bias. The researcher creatively blinded the evaluator, used a valid outcome measurement, and only lost one infant when conducting the study. Because of these reasons, along with other aspects, I felt this article would reliably answer my initial question.

Results

Summary of the study

The article I have chosen focuses on the benefits of using kinesiology tape (KT) to improve the muscular imbalance of the lateral neck flexors on infants. Imbalance is caused by a condition called Congenital Muscular Torticollis and is referred to as CMT throughout the

article. In CMT the affected side muscles are stronger while the contralateral side proves to be weaker. Because of this, the study uses a "muscle-relaxing" technique of KT on the affected side for results. Using the Muscle Functioning Scale (MFS), 29 infants were tested by a blinded evaluator before and after taping. As a randomized masked study, in order to blind the evaluator from the tape, all infants wore a scarf around their necks. All 29 infants were randomly assigned to a control (13 infants) or intervention group (16 infants). After taping and testing infants with the MFS, the intervention group's scores drastically decreased on the affected side and increased on the unaffected side. This means the KT method did have an immediate effect on the lateral flexors. However, the study mentions KT use as a complementary form of treatment and stressed the importance of continuing strengthening exercises along with using KT.

Appraisal of the study introduction

Overall, I believe the introduction is comprehensive in explaining congenital muscular torticollis and the clinical relevance of the condition. After reading the introduction, the audience has a complete understanding of the study including an explanation of the muscle functioning scale and kinesiology tape. Importantly, the purpose of the study and ethical approval are clearly stated in closing the paragraph. One of strongest points of the introduction is the use of all 18 references listed. In doing this, the reader can trust the introduction due to its support from the literature.

Conversely, in analyzing all 18 references, some bias was found which becomes a major weakness to the work. All literatures were from credible primary sources however 5 of 18 were self-sources. Self-sourcing may increase bias due to the author wanting the audience to read other studies previously conducted. If the same author references previous studies, it may be

because he or she knows the outcome positively supports the current study. Aside from this flaw, all other references were strong and used throughout the introduction.

Appraisal of the study methods

Strengths in the methods portion of the article include the study's ability to blind the evaluator, low withdrawal percentage, and description of the process. As a double-blind study, both the subjects and the evaluator were blinded. The families were blinded until group assignment however blinding the evaluator from KT became the tricky part. For this the researcher placed scarves on all infants including those who were not taped. This allowed the evaluator to take measurements without ever knowing which infant belonged to the experimental group. Applying the scarf showed the researcher's creativity and commitment to blinding the evaluator which strengthens the study overall. The study began with 30 infants but only 29 participated throughout the entire study. One infant was lost simply because the subject did not tolerate wearing the scarf; a 3% attrition percentage. If the researcher had not excluded this infant, the evaluator's blindness be compromised. The detail in the methods portion proves to be the main strength of the study as a whole. A paragraph is dedicated to the MFS instrument used, as well as reference to the appendix explaining the scoring of the MFS. Similarly, an explanation of the KT application was included along with pictures of KT placement and scarf use. The researcher also described precisely how to position the infant when testing for MFS scores. Attention to detail allows for the experiment's replication in future studies.

Unfortunately, one weakness in particular seems connected to KT. When describing the procedure of applying tape to the infants, the author simply states the tape was "slightly

stretched". Typically, the stretch is described in terms of percentage, therefore this subjective description can lead to error in replication of the experiment.

Appraisal of the study results

To some the results section is clear and to the point, to others it may seem short. One detailed paragraph is dedicated to explaining the significance of the results. Significant differences included lower scores for the intervention group on the affected side, higher scores for the intervention group on the unaffected side, and an overall difference between the two groups. This shows clinical significance because it proves the KT helps to immediately relax the lateral flexors of the neck. Because the significance is explained, the readers can understand the summary of results gathered.

Ultimately, the results section is fairly brief and does not contain as much detail as the methods. The significance of the results is stated however specific numbers are not discussed. Instead one graph is included to represent the data of the study. A graph, rather than a table, may confuse some readers. Correspondingly, the line graph (normally used to represent date over time) is hard to follow at first glance. The line is continuous provides no clear distinction between the control and experimental groups. Instead the author includes a caption telling the reader, "Infant 1-16 intervention group, infant 17-29 control group". The figure also uses different colored lines to differentiate before and after intervention which again may cause misinterpretation. One table is included however, it only provides the distribution of age, gender, and affected side in the groups; no data. Readers who prefer visual aids may have a hard time understanding the results.

Appraisal of the study discussion

In the first sentence of the discussion, the author restates the hypothesis and follows with confirmation from the data. This provides a brief overall conclusion statement to remind the reader of the study's findings. In three sentences, this paragraph briefly summarizes all important aspects. The major strength found was the author's awareness of limitations of the study. Described as a "major limitation", the researcher states, "It is important to determine whether KT also decreases treatment time." This statement reports the study's limit of only looking at immediate affects, leading to the author acknowledging the need for further studies on the subject. Also, the disadvantage of using infants as subjects was mentioned, due to unwillingness and difficulty to tape. Mentioning limitations are important in the reader understanding imperfections in the study.

In terms of weaknesses in the discussion, the author used a single reference in the beginning but did not reference any other literature. One reference could lead readers to question why no other sources were used to confirm the findings in this study. Also, the article referenced was written by Öhamn. Being a credible journal with an impact factor of 1.902, the reader may not see this as a weakness. However, self-sourcing can be seen as a way to increase the impact factor or cause bias.

Discussion

Clinically this study is significant because it directly answers a question asked by clinicians and multiple parents. Torticollis is a common diagnosis among infants and can be concerning for caretakers. This study proves KT has an immediate effect on infants with muscular imbalances of the neck which supports use by therapists in treatment. Although KT

must be used in conjunction with stretching and strengthening exercises, it provides instant results. This article also supports and confirms my question asked in the beginning. Proving the benefits of KT in improving asymmetrical positioning of the head in infants.

As a student, I am in favor of using the intervention along with appropriate exercises and stretching. If the clinician only uses KT due to the results in this data, there is a risk of providing improper therapy. Patients would see immediate results but could regress after a day. KT can be used as a supportive aspect but not as the primary outcome measure. I feel the article supports KT as an intervention while indicating it cannot be the only form of treatment. Furthermore, I feel the paper could have improved if the researcher had included a data table with scores for each patient along with specific p-values. Clinically speaking future researchers may benefit from the numerical data.

The measurement tool and statistical analysis used in the study, MFS and t-test, have proven reliable and valid among researchers. Along with the strengths of each section, I would confidently share this evidence with future patients. However, I do not believe appropriate application is possible without first acquiring a certification in KT. Once certified, KT would be beneficial due to the evidence shown in the data.

After thoroughly reading through each section, I can fully support KT as an intervention for immediate results in infants with torticollis. While there are some weaknesses within the paper, it was well written with minimal bias. It was evident the researcher paid attention to detail to make sure readers understood each topic discussed. Overall, the researcher catered to parents concerned with results and how they apply to patients. It was a clear, brief, and simple study informational to the pediatric community.